

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Original): A method of preparing patterned colloidal crystals, the method comprising:

filling a monomer solution into interstices of colloidal crystals for photopolymerization inside them; and

performing a selective photopolymerization process in the interstices of colloidal crystals by use of a mask.

Claim 2 (Original): The method as defined in claim 1, wherein the monomer solution for the photopolymerization comprises an acrylate monomer.

Claim 3 (Original): The method as defined in claim 2, wherein the acrylate monomer is selected from the group consisting of hydroxypropyl methacrylate, hydroxyethyl methacrylate, methacrylate, or mixtures thereof.

Claim 4 (Original): The method as defined in claim 1, wherein the colloidal crystals each comprise at least one selected from the group consisting of polystyrene, polymethyl methacrylate, polyphenyl methacrylate, polyacrylate, polyalphamethylstyrene, poly1-methylcyclohexyl methacrylate, polycyclohexyl methacrylate, polybenzyl methacrylate, polychlorobenzyl methacrylate, poly1-phenylcyclohexyl methacrylate, poly1-phenylethyl methacrylate, polyperfuryl methacrylate, poly1,2-diphenylethyl methacrylate, polypentabromophenyl methacrylate, polydiphenylmethyl methacrylate, polypentachlorophenyl methacrylate, copolymer of methyl methacrylate and benzyl methacrylate, copolymer of styrene and acrylonitrile, copolymer of methyl methacrylate and 2,2,2-trifluoroethyl methacrylate, copolymer of methyl methacrylate and 2,2,3,3,3-pentafluoropropyl methacrylate, copolymer of methyl methacrylate and 1,1,1,3,3,3-hexafluoroisomethacrylate, copolymer of methyl methacrylate and 2,2,3,3,4,4,4-heptafluorobutyl methacrylate, copolymer of 2,2,2-trifluoroethyl methacrylate and 2,2,3,3,3-pentafluoropropyl methacrylate, copolymer of 2,2,2-trifluoroethyl methacrylate and 1,1,1,3,3,3-hexafluoroisomethacrylate, copolymer of styrene and methyl methacrylate, and copolymer of 2,2,2-trifluoroethyl methacrylate and 2,2,3,3,4,4,4-heptafluorobutyl methacrylate.

Claim 5 (Original): The method as defined in claim 1, wherein the colloidal crystals each comprise at least one selected from the group consisting of SiO₂, TiO₂, ZnS, ZnO₂, and Fe₃O₄.

Claim 6 (Original): The method as defined in claim 1, wherein light for use in the polymerization is selected between ultraviolet ranges and visible ranges.

Claim 7 (Original): A method of preparing patterned colloidal crystals, the method comprising:

filling a first monomer solution for photopolymerization between planar colloidal crystals;

performing a first selective photopolymerization process between the colloidal crystals by use of a mask, to prepare firstly patterned colloidal crystals; and

filling a second monomer solution for photopolymerization between the firstly patterned colloidal crystals, followed by performing at least one photopolymerization process between the firstly patterned colloidal crystals by use of an additional mask.

Claim 8 (Original): The method as defined in claim 7, wherein the first monomer solution or the second monomer solution for the photopolymerization comprises an acrylate monomer.

Claim 9 (Original): The method as defined in claim 8, wherein the acrylate monomer is selected from the group consisting of hydroxypropyl methacrylate, hydroxyethyl methacrylate, methacrylate, or mixtures thereof.

Claim 10 (Original): The method as defined in claim 7, wherein the colloidal crystals each comprise at least one selected from the group consisting of polystyrene, polymethyl methacrylate, polyphenyl methacrylate, polyacrylate, polyalphamethylstyrene, poly1-methylcyclohexyl methacrylate, polycyclohexyl methacrylate, polybenzyl methacrylate, polychlorobenzyl methacrylate, poly1-phenylcyclohexyl methacrylate, poly1-phenylethyl methacrylate, polyperfuryl methacrylate, poly1, 2-diphenylethyl methacrylate, polypentabromophenyl methacrylate, polydiphenylmethyl methacrylate, polypentachlorophenyl methacrylate, copolymer of methyl methacrylate and benzyl

methacrylate, copolymer of styrene and acrylonitrile, copolymer of methyl methacrylate and 2,2,2-trifluoroethyl methacrylate, copolymer of methyl methacrylate and 2,2,3,3,3-pentafluoropropyl methacrylate, copolymer of methyl methacrylate and 1,1,1,3,3,3-hexafluoroisomethacrylate, copolymer of methyl methacrylate and 2,2,3,3,4,4,4-heptafluorobutyl methacrylate, copolymer of 2,2,2-trifluoroethyl methacrylate and 2,2,3,3,3-pentafluoropropyl methacrylate, copolymer of 2,2,2-trifluoroethyl methacrylate and 1,1,1,3,3,3-hexafluoroisomethacrylate, copolymer of styrene and methyl methacrylate, and copolymer of 2,2,2-trifluoroethyl methacrylate and 2,2,3,3,4,4,4-heptafluorobutyl methacrylate.

Claim 11 (Original): The method as defined in claim 7, wherein the colloidal crystals each comprise at least one selected from the group consisting of SiO_2 , TiO_2 , ZnS , ZnO_2 , and Fe_3O_4 .

Claim 12 (Original): The method as defined in claim 7, wherein light for use in the polymerization is selected between ultraviolet ranges and visible ranges.